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Periodic Solutions of Ordinary Differential Equations. Preliminary report.

We prove a fixed point theorem for a class of nonlinear operators encountered in ordinary differential equations. The theorem differs from the theorems of Tychonoff and Schauder in that the operators in question do not need to act on a convex set. The proof depends on the Tychonoff fixed point theorem and a result of Blackwell. The theorem is then applied to prove the existence of periodic solutions of a class of ordinary differential equations. We also extend a theorem of Yoshizawa concerning the existence of periodic solutions of nonlinear differential systems to a general class of perturbed nonlinear systems of ordinary differential equations. (Received September 06, 2013)